

# EPILEPSY and Related Disorders

# by

# WILLIAM GORDON LENNOX

A.B., A.M., M.D., Sc.D. (Hon.)

Associate Professor of Neurology, Emeritus, of Harvard University School of Medicine. Formerly Chief of Seizure Division, Children's Medical Center, Boston; National Consultant in Epilepsy to the Veterans Administration; President, International League Against Epilepsy; and Editor of "Epilepsia"

with the collaboration of

MARGARET A. LENNOX A.B., M.D.

Member, Institute of Neurophysiology, Copenhagen. Formerly Assistant Professor of Psychiatry, Yale University School of Medicine

volume one



J. & A. CHURCHILL Ltd.

104 GLOUGESTER PLACE, W.1

COPYRIGHT, ©, 1960, BY WILLIAM G. LENNOX AND MARGARET A. LENNOX

ALL RIGHTS RESERVED. NO PART OF THIS BOOK IN EXCESS OF ONE HUNDRED WORDS MAY BE REPRODUCED IN ANY FORM WITHOUT PERMISSION IN WRITING FROM THE PUBLISHER.

LIBRARY OF CONGRESS CATALOG CARD NO. 58-6783

FIRST EDITION

Published in Great Britain by J. & A. Churchill Ltd., London

PRINTED IN THE UNITED STATES OF AMERICA

# Also by William G. Lennox

THE HEALTH OF MISSIONARY FAMILIES IN CHINA

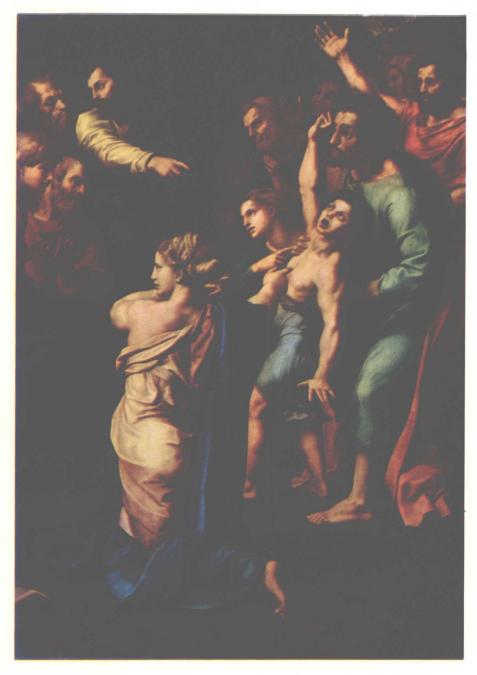
EPILEPSY FROM THE STANDPOINT OF

PHYSIOLOGY AND TREATMENT

(WITH STANLEY COBB)

THE HEALTH AND TURNOVER OF MISSIONARIES
SCIENCE AND SEIZURES

# EPILEPSY and Related Disorders



A detail of "The Transfiguration" by Raphael Sanzio (1483-1520). "Lord, have mercy on my son, for he is an epileptic and he suffers terribly; for often he falls into the fire, and often into the water. And I brought him to your disciples, and they could not heal him." (Matthew 17:15-16. Revised Standard Version.) This was Raphael's last painting, before his death on Good Friday, 1520, at the age of 37. The painting hangs in the Vatican Gallery in Rome.

To, and for,

Emma Buchtel Lennox

#### INTRODUCTION

this disorder. We list only a minority of these publications. The first personal pronoun, when used in the text, refers to the senior author.

Ancient textbooks of medicine commonly employed a subtitle that indicated the order of the diseases to be described, "a capite ad pedes." Nowadays, a simple "from the head to the feet" presentation is not possible for a subject as complicated and many-sided as ours. The first volume is concerned with wide orientation, with history, the many manifestations of epilepsy, and its etiology, genetic and acquired. The second volume explores mentality, origin, means of diagnosis and treatment, and the psychological and social problems involved.

Writers of books must distinguish the transient from the lasting. Knowledge of the mechanism of the brain with respect to seizures changes and, thank heaven, grows. What is written now on these matters will be of mere historical interest x years hence. On the other hand, the experiences of persons subject to seizures have never-ending interest and value. The lively case histories recounted by writers in centuries past arouse our appreciation and sympathy. Epilepsy owes its ever-fresh interest to the fact that the history and problems of each person (even if one of identical twins) differ in some important respect from those of every other person. From the many thousands of patients examined and treated during the past thirty-five years, we have selected some three hundred persons who in their history or physical findings illustrate one or, more often, several facets — clinical, electrical, or social — of this disorder of many faces. Because of the seriousness of many, these cannot be called cross-sectional or average cases.

The treatment of the epileptic is a person-to-person affair; hence, when feasible, we have substituted "persons" for "patients," and to designate the individual we prefer a name to a case number. Andree in his book *Cases of the Epilepsy, Hysteric Fits, and St. Vitus's Dance* (1753, p. 3) justified his use of patients' names in this way:

I take the Liberty of mentioning the Names at length of those who were cured at the Expence of the Hospital, deeming it a Debt due from them to the Public, to shew by their Examples, what Method may serve to cure their Benefactors, and other Fellow Creatures, afflicted with the like Diseases. A few anonymous Cases are introduced also from my private Practice, to corroborate some of the Others. And to avoid all Suspicions of Fallacy, if these should be called in Question, I can at any Time prove every Particular in relation to them.

About identification, we respect the wishes of patients or parents. However, use of a person's name emphasizes the personal relationship which exists between him and his doctor. Again, we doctors insist that epilepsy is an illness which should not call for secrecy any more than diabetes,

# Introduction

No disease is more intriguing, more protean, more pressing for solution than epilepsy and conditions related to it. These volumes attempt a broad portrayal of diverse manifestations, causes, consequences, and treatments. They attempt to provide historical perspective, to portray the medical and social problems of the individual patient, and to consider what yet needs to be learned and done.

The book *Epilepsy from the Standpoint of Physiology and Treatment* (Lennox and Cobb, 1928) summarized the knowledge of that day. *Science and Seizures* (1941, 1946) is intended primarily for the intelligent portion of the lay public. The present book, like that of Gowers (1881, 1901), strives first to meet the practical needs of the physician, and through him the patient. The writing is meant to be informal and lightened with whatever of history or of humor is at hand. We take to heart *The Complete Plain Words*, a book by Sir Ernest Gowers (1954), son of Sir William. He in his Oslerian Oration (1958) quotes Sir Clifford Allbutt: "Force, lucidity, unity, simplicity, economy of expression are virtues which we may all attain; originality will be as God pleases."

Fortunately, certain areas of knowledge are already competently dealt with. Volume II of the *Atlas of Electroencephalography* by F. A. and E. L. Gibbs (1952) is a rich museum of life-sized tracings, a wealth of clinical and electroencephalographic data, and a storehouse of some 900 references. *Epilepsy Handbook* by Gibbs and Stamps (1958) is what the name implies. Penfield and Jasper (1954), in *Epilepsy and the Functional Anatomy of the Human Brain*, deal in satisfying detail with the neuroanatomy and neurosurgery of seizures; hence, these subjects are only epitomized here.

Authors today are dismayed by the many thousands of pertinent contributions to knowledge that should be brought to the attention of the reader. Only a sample of these can be used. We (W. G. and Margaret Lennox) confess to past publication of approximately 225 articles that deal in some manner with our present subject. These appeared in 80-odd volumes or magazines, evidence of the widely scattered repercussions of

#### INTRODUCTION

arthritis, or migraine does. Yet many epileptics live in a cocoon of concealment. Breaking this skein will give them and those who follow suit a new freedom. Epileptics can perform this miracle for themselves. To an extent, many of them do so in this book. "We are willing if it will help the doctors" is a common reply of patients to our query about identification. The majority of patients, or their parents to whom the matter was explained, signed a statement of consent that the full name (or a certain portion of it) should appear with the case history. Many persons could not be reached and a small number wished to remain anonymous. Males of these groups are named Hector (holding fast) and females are called Eunice (happy victory). The letter or two following these names forms a code for identification in our own records. (See the remark of the Chesney twins, page 580.)

My daughter-collaborator organized the laboratory of electroencephalography and the clinic for epileptics at the Grace-New Haven Hospital of Yale University in New Haven, and is now engaged in neurophysiological research at the Institute of Neurophysiology in Copenhagen. She has provided much needed encouragement and critical aid; and will, it is hoped, contribute more substantially to any future revision.

As with any long-term project of investigation and treatment, scores of persons have either supervised, collaborated, or assisted. Successive professorial chiefs have been Stanley Cobb (who headed the project for many years), James H. Means, Francis Peabody, Tracy J. Putnam, H. Houston Merritt, Derek Denny-Brown, Harry C. Solomon, and Charles A. Janeway. For fifteen years Frederic A. and Erna Leonhardt Gibbs were comrades-in-arms in laboratory research. Representing, as they do, a happy union of inspiration and hard, driving work, they are primarily responsible for the success of our investigations in the fields of brain circulation and electroencephalography.

Names of many of the forty-five co-authors of articles appear in the bibliography. They with secretaries, headed now by Mrs. William H. Keohane, technicians, patients, and contributors of funds (principally the Rockefeller Foundation) share in whatever virtue this book possesses and in whatever help it gives to doctors and their patients. Aside from the Harvard Epilepsy Commission and the Holman and Milton Funds of Harvard University, grants for research or training were received from the Macy, Markle, Stillman, Dazian, and Harrigan Funds. The Children's Bureau and the Institute of Neurological Diseases and Blindness (of the National Institutes of Health) have provided long-term substantial aid.

Photographs of patients and staff are by F. R. Harding, F.B.P.A.; the

#### INTRODUCTION

library scene is by Robert Ogilvie. Dr. Jerome K. Merlis critically perused a number of the chapters. Sandoz has contributed the color plates. The number of years spent in preparation need not be confessed. Were it not for faithful wife and fellow workers, some of them pictured opposite page 1030, and a publisher interested beyond the call of commerce, Theodore A. Phillips of Little, Brown and Company, the contents of this book would still repose in filing cabinets and in perishable memory.

Readers may thank anonymous givers for making it possible to have two volumes for approximately the price of one.

On page 1053 we mentioned that some thirty local or regional groups in the United States work in behalf of the epileptic. That page was written before the American Epilepsy Federation, which seeks to co-ordinate the work of all groups, was formed. The Chinese have a proverb that fits the present need. "Three men of one mind, yellow earth turns to gold." The authors (M.A.L. and W.G.L.) wish to promote this effort by contributing the royalty from the sale of these volumes to organizations working for the epileptic, beginning with the American Epilepsy Federation.

WILLIAM GORDON LENNOX

March, 1960

# Contents

# VOLUME ONE

Introduction		ix
1	Paroxysmal Disorders	3
	Rhythm and Dysrhythmia 4 Inherent Rhythm 5 Genetics of Nervous Activity 5	
	Conditions with Altered Consciousness or Motion 6  Exalted Consciousness 7  Impaired Consciousness 7  Excess of Movement 8  Paroxysmal Weakness 9	
	The Expanding Domain of Epilepsy 10	
2	HISTORICAL PERSPECTIVE — REVIEW AND PREVIEW	11
	Epilepsy Before 1850 13 Hippocrates 13 Galen 14 The Causes of Epilepsy 15 Supernatural Forces 15 Humors 17 Toxins 17 The Treatment of Epilepsy 18 General Hygiene 19 Dealing with the Supernatural 20 Correction of Somatic Disorders 21 Combating Bad Humors 23 Neutralizing Endogenous Toxins 24 Care During a Convulsion 25 Ancient Alchemy 26 Theory and Practice Since the Renaissance 27	
	Epilepsy Since 1850 31	
	Epilepsy in the Future 36	
	AIII	

3	Names and Definitions	39
	Designations 39	
	Quotations, Galen to Now 42 Five Features of a Seizure 43 Disturbed Consciousness 44 Disorders of Motion 45 Disorders of Sensation 45 Neurovegetative Manifestations 45 Other Psychic Manifestations 45	
4	Areas of Orientation	47
	Origins — A Search for the Cause 47	
	Disease Entity or Symptom 51 Epilepsy Not the Great Unknown 53	
	The Semantics of Etiology 54 Genetic Epilepsy and Acquired Epilepsy 56 Metabolic Epilepsy and Organic Epilepsy 56 Assignment of the Cause 57	
	Related Areas of Epilepsy 58 Articulation of Knowledge 58	
	Seizure Patterns 61  Names of Patterns 61  Descriptive 62  Anatomic 62  Physiologic (including Electrical) 63  Clinical Classification 64	
5	PETIT MAL TRIAD	66
	Pure Petit Mal (Petits — Absence — Pyknolepsy — Petite Absence) 67  The Name 68 A First Account 69 Pyknolepsy 70 Reasons for Prior Consideration 71 Descriptive 71 Aura 71 Unconsciousness 71 Muscular Movements 73 Automatic Component 75 Sensation 76 Autonomic Function 77	
	xiv	

Course of Attacks 78 Frequency 79 Petit Mal Status 79 Differential Diagnosis 89 Evidence of Genetic Origin 90 Evidence for Acquired Causes 90 Mentality 91 Response to Mental Activity 91 Response to Physicochemical Changes 93 Effect of Drug Therapy 93 The Chance of Later Convulsions 94
The Fast Spike-Wave of Pure Petit Mal 95 Historical Footnote 95 Descriptive 99 Monopolar Versus Bipolar Placements 102 Variations 106 Mental Function and Spike-Wave Dysrhythmia 108 Specificity 111 Numerical Correlations 112 Multiple (Poly) Spikes 117 Subclinical Discharges 117 Localization of Discharges 118 Heredity 119 Age, Sex, and Time 121 Medication 122
Myoclonia 122 Clonic versus Clonus 123  Myoclonic Epilepsy 124 History 124 Descriptive 125 Differential Diagnosis 127  Massive Myoclonic Jerks 133 Causes 135 Neurologic Mechanism 135 Myoclonus Epilepsy (Myoclonus Multiplex) 137 Epilepsia Partialis Continua (Mono-Epilepsy) 141 Palatal Myoclonus 143
Astatic (Atonic — Akinetic — Inhibition) Epilepsy Historical 144 Descriptive 146 Differential Diagnosis 147 Clinical Correlates 150 Electroencephalograms 151 Post-Childhood Falls 152 Neurologic Implications 155 Prognosis 155 Treatment 155

	The Slow-Spike-Wave EEG and its Clinical Correlates Historical 156 Descriptive 157 Clinical Correlates 158 EEG Correlations 163 Sex and Age 163 Other Electroencephalographic Abnormalities 164 Types of Seizure 165 Age at Onset and Types of Seizure 165 Influence of Brain Damage 165 Genetic Influence in the Two Groups 166 Mentality 167 Response to Medication 167 Summary 169	
	Numerical Relationships of the Petit Mal Triad 170 Age at Onset 170 Influence of Cause and Sex 170 Petit Mal, a Disorder of Youth 172	
6	Symptoms of Warning	174
	Prodromata 175 Psychic 175 Neurovegetative 175 Sensory 175 Motor 175	
	Aura 176 Statistical Data 179 Psychic 179 Neurovegetative 179 Special or Ill-Defined Sensations 180 Sensations Referred to the Head 180 Special Sense 181 Motor 182	
	The Horror of It 182	
7	THE CONVULSIVE TRIAD	183
	Generalized Convulsions (Grand Mal) 184  Descriptive 184  The Autonomic Conflict 188  Sensory Participation 190  The Account of a Patient 190  Neuropathologic Background 192  The Electroencephalogram 193  Induced Convulsions 196  xvi	

	Focal (Local — Unilateral — Partial) Epilepsy 200  Historical 200  Descriptive 202  Focal Paretic (Inhibition) Seizures 208	
	Jacksonian (Rolandic) Epilepsy — A Marching Spasm or Sensation 212  Motor Jacksonian (Anterior Rolandic) Spasm 213 Descriptive 214  Sensory Jacksonian (Posterior Rolandic) Seizures 215 Descriptive 216 Interruption of March 218 The Role of Heredity 219 Pathologic Lesions 219 The Electroencephalogram 219	
	Convulsive Variants 220 Tonic Seizures 220 Tonic Postural Fits 221 Cerebellar Fits 222	
	Distribution of Convulsive Patterns 223 Features of a Convulsive Seizure 223 Age at Onset, Origin, and Sex 225	
8	PSYCHOMOTOR (PSYCHIC, TEMPORAL) EPILEPSY 22	7
	Diverse Seizure Manifestations 227 Historical 228 Names 229 Correlating Conditions 230 Elements of a Seizure 232 Classification of Clinical Phenomena 233	
	Automatic Epilepsy (Automatisms) 234  Awareness Grossly Impaired 235  Awareness Seemingly Maintained 241  Hidden Amnesia 242  Differential Diagnosis 250  Sleep, Somnambulism, and Incubus 251  Excessive or Bizarre Muscular or Psychic Activity 252  Epilepsia Cursiva (Running Fits) 252  Fugues 254  Mania 254  Paroxysmal Behavior Disorders 256  Distorted States of Mind or Personality 259	
	xvii	

Subjective (Psychic) Seizures 266  Hallucinations 267  Smell 267  Taste 268  Sight 268  Sound 270  Touch 271  Illusions 273  Visual Illusions 274  Psychic Seizures 274  Dream States and Vertiginous Episodes 274  Reiterated Experiences 275  Seizures of Pleasure 278  Compulsive Laughter — Crying 280  Seizures of Fear 282  Compulsive Thinking 283  Compulsive Eroticism (Nymphomania) 285  Depressive Seizures 286	
Psychomotor Miscellanea 288 Tonic Focal Seizures 288 Organic Background 290	
Arrest of Motion — and of Mentation 296 Aphasia 298 States of Stupor or Coma 301	
The Electroencephalogram 310	
Numerical Relationships 315 Distribution by Age at Onset 315 Distribution by Cause and Age at Onset 315 Distribution by Age When Examined 316 Seizure Correlates 317 Genetic Influence 318 Role of Brain Damage 318 Personality and Mentality 319 Anatomic Abnormalities 320	
9 Autonomic (Diencephalic) Epilepsy	322
Diagnostic Considerations 323 Thermal Epilepsy 331 Respiratory Seizures 336 Autonomic Seizures That Involve the Extremities 340	
Neurologic Mechanisms 341	
EEG Findings 341	
The Enigma of Age 343	
Recurrent Phenomena That Evade Diagnosis 343 xviii	